

WHAT IS CLAIMED IS:

1. A liquid fuel quantity measurement system comprising:

5 a first container (3) for interiorly storing liquid fuel;

pressure application means (6) for raising air pressure within said first container (3) by supplying air into said first container (3);

10 air-pressure measurement means (5) for measuring the air pressure within said first container (3);

a first pipeline (13) through which said first container (3) and said pressure application means (6) communicate with each other;

15 a second container (4) connected with said first container (3);

a second pipeline (12) through which said first container (3) and said second container (4) communicate with each other;

20 feed means (14, 8) for feeding the liquid fuel within said first container (3) into said second container (4) through said second pipeline (12);

detection means (9) for detecting a reduction in the liquid fuel within said second container (4);

25 control means (11) for controlling said feed means (14, 8) and said pressure application means (6) by

selecting either a pressure mode or a supply mode, based on information from both said air-pressure measurement means (5) and said detection means (9);

air-volume measurement means for measuring the
5 volume of air supplied into said first container (3) through said first pipeline (13) by said pressure application means (6); and

arithmetic means (7) for calculating, during said pressure mode, the volume of the liquid fuel within
10 said first container (3) from both the volume of air measured by said air-volume measurement means and a quantity of change in air pressure calculated from the air pressure within said first container (3) measured by said
air-pressure measurement means (5), and for calculating,
15 during said supply mode, the volume of the liquid fuel within said first container (3) from the number of times that the liquid fuel was fed from said first container (3) into said second container (4).

20 2. A liquid fuel quantity measurement system comprising:

a first container (3) for interiorly storing liquid fuel;

pressure application means (6) for raising air
25 pressure within said first container (3) by supplying air into said first container (3);

air-pressure measurement means (5) for

measuring the air pressure within said first container (3);

a first pipeline (13) through which said first container (3) and said pressure application means (6) communicate with each other;

air-volume measurement means for measuring the volume of air supplied into said first container (3) through said first pipeline (13) by said pressure application means (6); and

arithmetic means (7) for calculating the volume of the liquid fuel within said first container (3) from both the volume of air measured by said air-volume measurement means and a quantity of change in air pressure calculated from the air pressure within said first container (3) measured by said air-pressure measurement means (5).

3. A liquid fuel quantity measurement system comprising:

a first container (3) for interiorly storing liquid fuel;

a second container (4) connected with said first container (3);

a second pipeline (12) through which said first container (3) and said second container (4) communicate with each other;

feed means (14, 8) for feeding the liquid fuel

within said first container (3) into said second container (4) through said second pipeline (12);

detection means (9) for detecting the remaining quantity of the liquid fuel within said second container (4);

control means (11) for controlling said feed means (14, 8), based on information from said detection means (9); and

arithmetic means (7) for calculating the volume of the liquid fuel within said first container (3) from the number of times that the liquid fuel was fed from said first container (3) into said second container (4).

4. The liquid fuel quantity measurement system as set forth in claim 1 or 2, wherein said air-volume measurement means comprises raised-pressure measurement means (5) for measuring the raised pressure, and storage means for storing a corresponding relationship between the raised air pressure and the volume of air supplied into said first container (3).

5. The liquid fuel quantity measurement system as set forth in claim 4, wherein said air-volume measuring means (5) is also used as said raised-pressure measurement means (5).

6. The liquid fuel quantity measurement system as

set forth in claim 1, further comprising:

a first pipeline valve (15) for regulating flow within said first pipeline (13); and

5 a second pipeline valve (14) for regulating flow within said second pipeline (12);

wherein a portion of said first pipeline (13) extending from said first pipeline valve (15) toward said first container (3) and a portion of said second pipeline (12) extending from said second pipeline valve (14) toward
10 said first container (3) are merged into one.

7. The liquid fuel quantity measurement system as set forth in claim 6, provided in a construction machine (1) equipped with a traveling substructure (30) and a
15 revolving superstructure (20) revolvably mounted on said traveling substructure (30) through a swivel joint (10),

wherein said first container (3) is provided as a main fuel tank in said traveling substructure (30), and said second container (4) is provided as an auxiliary
20 fuel tank in said revolving superstructure (20).

8. A liquid fuel quantity measurement method comprising:

a first container (3) for interiorly storing
25 liquid fuel;

pressure application means (6) for raising air pressure within said first container (3) by supplying air

into said first container (3);

a first pipeline (13) through which said first container (3) and said pressure application means (6) communicate with each other;

5 a second container (4) connected with said first container (3);

a second pipeline (12) through which said first container (3) and said second container (4) communicate with each other; and

10 feed means (14, 8) for feeding the liquid fuel within said first container (3) into said second container (4) through said second pipeline (12);

wherein, when the air pressure within said first container (3) is less than a predetermined pressure, air
15 is supplied into said first container (3) through said first pipeline (13) by said pressure application means (6), both the volume of the supplied air and a quantity of change in the air pressure within said first container (3) due to the air supply are detected or calculated, and
20 the volume of the liquid fuel within said first container (3) is calculated from both the volume of the supplied air and the quantity of change in the air pressure;

and wherein, when the liquid fuel within said second container (4) is less than a predetermined quantity,
25 a predetermined quantity of liquid fuel is fed from said first container (3) into said second container (4) through said second pipeline (12) by said feed means (14, 8), and

the volume of the liquid fuel within said first container (3) is calculated based on the number of times that the liquid fuel was fed.

5 9. A liquid fuel quantity measurement method comprising:

 a first container (3) for interiorly storing liquid fuel;

 pressure application means (6) for raising air
10 pressure within said first container (3) by supplying air into said first container (3); and

 a first pipeline (13) through which said first container (3) and said pressure application means (6) communicate with each other;

15 wherein air is supplied into said first container (3) through said first pipeline (13) by said pressure application means (6), both the volume of the supplied air and a quantity of change in the air pressure within said first container (3) due to the air supply are
20 detected or calculated, and the volume of the liquid fuel within said first container (3) is calculated from both the volume of the supplied air and the quantity of change in the air pressure.

25 10. A liquid fuel quantity measurement method comprising:

 a first container (3) for interiorly storing

liquid fuel;

a second container (4) connected with said first container (3);

5 a second pipeline (12) through which said first container (3) and said second container (4) communicate with each other; and

feed means (14, 8) for feeding the liquid fuel within said first container (3) into said second container (4) through said second pipeline (12);

10 wherein a predetermined quantity of liquid fuel is fed from said first container (3) into said second container (4) through said second pipeline (12) by said feed means (14, 8), and the volume of the liquid fuel within said first container (3) is calculated based on the number
15 of times that the liquid fuel was fed.